Standardisation of morphological types of intraparenchymal distribution of the hepatic veins – III. Right hepatic veins

P Matusz*, AM Pusztai, DE Zahoi, E Hordovan

Department of Anatomy, Faculty of Medicine, University of Medicine and Pharmacy "Victor Babes" Timisoara, Romania

The right hepatic vein is the most important vein of liver's efferent pedicle, both due to its size and to the volume of the drained parenchyma. It is situated in the plane of the right portal fissure between the medial and the right lateral division. The most often encountered is the presence of the right hepatic vein as a unique vein. Sometimes, in the plane of the right portal fissure may appear an inferior right hepatic vein and a middle right hepatic vein (usually of smaller sizes). We analyzed and standardized the morphological types of the right hepatic veins on a study material of 150 hepatic corrosion casts. They were made by injecting with plastic (AGO II paste and TECHNOVIT 7143) of the hepatic vasculo-ductal systems, followed by corrosion of the hepatic parenchyma with hydrochloric acid. In standardizing the morphological types of the right hepatic veins we considered three parameters: the general aspect of the venous trunk (long or short), the number of affluents of origin and their length. The superior right hepatic vein, having a constant presence (100%), is the largest collector in the plane of the right portal fissure. Considering both the sizes and the number and position of the affluents of the trunk of the right hepatic vein, as well as the modality of collecting of the right postero-superior vein and of the right transverse vein, there are three morphological types of spatial distribution of the right hepatic vein: Type I (65.33% cases), with a long, well individualized venous trunk, receiving into its distal portion the right antero-lateral vein and the right antero-medial trunk; Type II (24.67% cases), with a short venous trunk, formed by the confluence of the right anterior trunk with the right transverse trunk; Type III (10% cases), with a short venous trunk, formed by the confluence of the right anterior transverse vein with the left transverse vein. The inferior right hepatic vein was found in 10.67% cases. The middle right hepatic vein was found in 4% cases and in all cases where it was present it was the smallest of all. According to the number of the right hepatic veins found, we analyzed the modality of venous segmentation of the right part of the hepatic parenchyma and noticed that: in 89.33% cases there is only a single right hepato-venous segment, in 8% cases there are two right hepato-venous segments (a superior and an inferior one), and in 2.67% cases there are three right hepato-venous segments (superior, middle and inferior), according to the number of right hepatic veins present in the plane of the right portal fissure. Knowing these aspects of venous drainage of hepatic parenchyma could facilitate planning hepatic resection and transplant surgery.

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*Corresponding author
E-mail: matusz@umft.ro

Repeated, brief seizures induce long-lasting rearrangement of ionotropic glutamate receptor subunits in the rat hippocampus

A Mihály[1]*, E Dobó[1], E Molnár[2], A Bagosi[1], M Bakos[1], B Szűcs[1], A Vincze[1], N Károly[1]

[1]Department of Anatomy, University of Szeged, Szeged, Hungary, [2]Department of Anatomy, University of Bristol, Bristol, UK

Repeated, brief epileptic seizures were induced with intraperitoneally injected 4-aminopyridine (4-AP) in adult Wistar rats, for two weeks, on a daily basis. The symptoms were observed carefully and evaluated on the Racine's scale. One day after the last injection and seizure, rats were decapitated in deep anesthesia, the brains were frozen in liquid nitrogen, and sectioned in the horizontal plane. Another group of rats were observed for two more weeks, without 4-AP injections, and decapitated as written above. The 15 μm thin sections were blotted onto nitrocellulose membranes, the membranes were fixed and the proteins detected with immunohistochemical method, using alkaline phosphatase-labeled secondary antibodies. The following subunit antibodies were used: NR1, NR2A, NR2B, GluR1, GluR1flop, GluR2, pan-AMPA (GluR 1-4, recognizing every AMPA subunit), and KA2. The immunostained membranes were scanned, and different layers of the hippocampus and neocortex were analyzed with densitometry. Hippocampi were also stained with a modified Timm's stain, and the stained area has been

analyzed with densitometry, similarly to the immunostained preparations. The learning ability of repeatedly convulsing rats was evaluated with a Morris water-maze test. In the hippocampus, an overall decrease of NR1 subunits was observed. NR2B remained unchanged, but NR2A increased significantly in every layer. GluR1 and GluR2 decreased in most of the areas and layers. The increase of the GluR1flop was observed in most of the layers. KA2 did change in the stratum lucidum of CA3, only. Less pronounced, but significant changes were detected in the entorhinal, perirhinal and somatosensory cortices, where the decrease of the NR1 subunit was observed. The NR2A and NR2B subunits displayed significant increases. The GluR1 and GluR2 subunits decreased only in the entorhinal and perirhinal areas. In the same areas GluR1flop showed a significant increase. Significant changes were detected in the KA2 subunit density: decrease in the entorhinal and perirhinal areas and increase in the somatosensory cortex.

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*Corresponding author
E-mail: mihaly@anatomy.szote.u-szeged.hu

Origin and immunocytochemical characterization of microglial cells in the avian pineal gland

D Molnar*, CL Frank, B Vigh, I Olah, N Nagy

Department of Human Morphology and Developmental Biology, Faculty of Medicine, Semmelweis University, Budapest, Hungary

The origin of the microglial cells in the central nervous system and in the pineal gland is still a matter of debate. Besides the neuroepithelial origin recently the mesodermal or hemopoietic origin is generally accepted but not experimentally proved. The aim of these studies was to characterize immunocytochemically the microglial cells and to provide experimental evidence for their origin in the pineal gland.

Different cell specific markers have been used for immunocytochemical characterization of the microglial cells; hemopoietic (CD45 and QH1 for chicken and quail cells, respectively); B lymphocyte (Bu1b and Bu1a for chicken and quail cells, respectively); T lymphocyte (CD3, CD4, CD8); macrophage (68.2, 74.2); MHC class II (TAP1, P2M11, 2D5) and avian dendritic cells (74.3, NIC2).

In the pineal parenchyma a poorly and highly ramified CD45+ hemopoietic cells can be distinguished. The former one expressed 68.2 and 74.2 macrophage markers while other was positive for B cell specific antibody (Bu1) and Ricinus communis agglutinin I (RCA I) a lectin specific for avian microglial cells. Recently, we do not know that the poorly and highly ramified cells represent two subpopulations of microglial cells or different maturation stages of the same cell type. The immunocytochemical characterization of the Bu1b+/CD45+/RCA I+ cells strongly suggested their hemopoietic origin and expression of MHC class II antigen makes them capable for antigen presentation.

To clarify the origin of microglial cells chick-quail chimera has been made: quail pineal gland from 10 days old embryo was isolated and transplanted into the coelomic cavity of a 3 days old, host chicken embryo and further incubated for 14 days. Hemopoietic cells from the chick host migrated to and colonized the grafted pineal gland where these host-derived cells differentiated into CD45+/Bu1b+/MHC II+/RCA1+ microglia cells. The presence of two types of cells (poorly and highly ramified) in immunologically matured birds indicates that hemopoietic microglial precursor cells enter the pineal gland not only at early embryonic age but also after hatching –perhaps throughout life time.

*Corresponding author
E-mail: david@ana2.sote.hu